

Talk: To students at the University of Vermont
Location: Burlington, VT
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Title: “Testing Cosmic Inflation”
Presenter: David Chuss

Abstract:

The Cosmic Microwave Background (CMB) has provided a wealth of information about the history and physics of the early Universe. Much progress has been made on uncovering the emerging Standard Model of Cosmology by such experiments as COBE and WMAP, and ESA's Planck Surveyor will likely increase our knowledge even more. Despite the success of this model, mysteries remain. Currently understood physics does not offer a compelling explanation for the homogeneity, flatness, and the origin of structure in the Universe. Cosmic Inflation, a brief epoch of exponential expansion, has been posited to explain these observations. If inflation is a reality, it is expected to produce a background spectrum of gravitational waves that will leave a small polarized imprint on the CMB. Discovery of this signal would give the first direct evidence for inflation and provide a window into physics at scales beyond those accessible to terrestrial particle accelerators. I will briefly review aspects of the Standard Model of Cosmology and discuss our current efforts to design and deploy experiments to measure the polarization of the CMB with the precision required to test inflation.